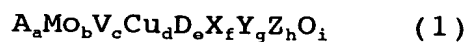


## Claims

1. A process for producing a catalyst, which comprises dispersing, in water, a used catalyst containing at least molybdenum, an A element (at least one element selected from the group consisting of phosphorus and arsenic) and an X element (at least one element selected from the group consisting of potassium, rubidium and cesium), adding thereto an alkali metal compound and/or ammonia solution, then adjusting the resulting mixture to pH 6.5 or less to generate a precipitate containing at least said molybdenum and said A element, and using the precipitate as a material for catalyst-constituting elements.
2. A process for producing a catalyst according to Claim 1, wherein the amount of the ammonium root in the mixture before adjustment to pH 6.5 or less is 0.5 mole or more relative to mole of the A element.
3. A process for producing a catalyst according to Claim 1, wherein the whole or part of the X element is removed from the mixture before adjustment to pH 6.5 or less.
4. A process for producing a catalyst according to Claim 1, wherein the precipitate is heat-treated at 200 to 700°C and then used as a material for

catalyst-constituting elements.

5. A process for producing a catalyst according to Claim 1, wherein the used catalyst was, before the use, a catalyst for production of methacrylic acid by gas phase catalytic oxidation of methacrolein, having a composition represented by the following formula (1):



(wherein Mo, V, Cu and O are molybdenum, vanadium, copper and oxygen, respectively; A is at least one element selected from the group consisting of phosphorus and arsenic; D is at least one element selected from the group consisting of antimony, bismuth, germanium, zirconium, tellurium, silver, selenium, silicon, tungsten and boron; X is at least one element selected from the group consisting of potassium, rubidium and cesium; Y is at least one element selected from the group consisting of iron, zinc, chromium, magnesium, tantalum, manganese, cobalt, barium, gallium, cerium and lanthanum; Z is sodium and/or thallium; a, b, c, d, e, f, g, h and i are each the atomic ratio of each element; when b is 12, a=0.5 to 3, c=0.01 to 3, d=0 to 2, e=0 to 3, f=0.01 to 3, g=0 to 3, h=0 to 3, and i is the atomic ratio of oxygen necessary for satisfying the valency

of each component other than oxygen).

6. A process for producing a catalyst according to Claim 5, wherein the amount of the ammonium root in the mixture before adjustment to pH 6.5 or less is 0.5 mole or more relative to mole of the A element.

7. A process for producing a catalyst according to Claim 5, wherein the whole or part of the X element is removed from the mixture before adjustment to pH 6.5 or less.

8. A process for producing a catalyst according to Claim 1, wherein the produced catalyst is a catalyst for production of methacrylic acid by gas phase catalytic oxidation of methacrolein, having a composition represented by the formula (1).

9. A process for producing a catalyst according to Claim 5, wherein the produced catalyst is a catalyst for production of methacrylic acid by gas phase catalytic oxidation of methacrolein, having a composition represented by the formula (1).

10. A process for producing a catalyst according to any of Claims 1 to 9, wherein the recovery of molybdenum is 50 mass % or more and the recovery of the A element is 50 mass % or more.

11. A process for producing a catalyst according to Claim 9, wherein the produced catalyst gives a

conversion of 90% or more relative to that of a  
virgin catalyst, a selectivity of 90% or more  
relative to that of the virgin catalyst and a per-  
pass yield of 90% or more relative to that of the  
5 virgin catalyst.

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